Setting and Stabilizing the Temperature for Vaccine Storage Equipment

Excerpt from the 2008 Centers For Disease Control and Prevention (CDC) Storage and Handling Toolkit.
Available at: http://www2a.cdc.gov/vaccines/ed/shtoolkit/

Setting and Stabilizing the Temperature

Who Should Adjust the Temperature?

Only the primary or backup vaccine coordinator should adjust the temperature of a vaccine storage unit. Limiting access to the thermostat reduces the risk that the temperatures will be adjusted inappropriately. If the thermostat requires adjustment, alert the vaccine coordinator or immediate supervisor. A warning sign should be posted on the storage unit that says, "Do not adjust refrigerator or freezer temperature controls. Notify (insert name) if adjustments are necessary."

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Thermostats

Refrigerator and freezer thermostats are marked in various ways, depending on the brand. There are a variety of ways to indicate the temperature setting. For example, some have a series of numbers or letters on the control knob. Others may have "MIN," "MED," and "MAX" marked on the knob or a dial ranging from "cold" to "coldest." In general, thermostats do not show temperatures, but rather the levels of coldness. The only way to know the temperature inside the unit is to measure it with a thermometer. In combination refrigerator-freezer units, the thermostat actually controls the volume of cold freezer-temperature air that goes into the refrigerator. Consult the manual that came with the refrigerator for instructions on how to operate the thermostat.

Refrigerator and freezer thermostats.

How to Adjust the Temperature

To adjust the temperature, first be sure the unit is plugged into a power source, then check the temperatures inside the refrigerator and freezer compartments. Next, turn the knob slightly toward a warmer or colder setting as necessary. Adjust the thermostat slowly so as not to exceed the recommended temperature range. Allow the temperature inside the unit to stabilize for **30 minutes** then recheck the temperature. Adjust the thermostat again as necessary.

- Aim to stabilize the refrigerator temperature around 40°F (5°C). Make sure the temperature does not fall below the lower limit or rise above the upper limit of the recommended refrigerator temperature range of 35° to 46°F (2° to 8°C).
- Aim to stabilize the freezer temperature at 5°F (-15°C) or colder. If you are using a combined refrigerator-freezer unit, be careful not to lower the freezer temperature so much that the refrigerator temperature falls below the recommended temperature range.

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- Combined refrigerator-freezer units use a cooling system that directs cold air from the freezer compartment into the main refrigerator compartment. This type of unit has two thermostat controls: one controls the freezer temperature and the other controls the volume of freezing air that enters the main refrigerator cabinet. Therefore, ***use care when adjusting the freezer temperature because this will affect the temperature of the air venting into the refrigerator compartment***.
- Without careful and frequent temperature monitoring inside the refrigerator compartment there is a danger of inappropriately freezing the refrigerated vaccines.

Frequent temperature monitoring of both the freezer and refrigerator compartments throughout the day as well as at the beginning and end of the work day is required whenever thermostats are adjusted. The temperature in a newly installed or newly repaired refrigerator may take 2 to 7 days to stabilize within the recommended range or 35° to 46°F (2° to 8°C). The temperature in a newly installed or newly repaired freezer unit may take 2 to 3 days to stabilize within the recommended range of 5°F (-15°C) or colder. Allow one week of twice daily refrigerator and freezer temperature recordings before using the unit to store vaccines.

When to Adjust the Temperature

The refrigerator temperature should be adjusted if it is outside the recommended range or if, over time, the temperature appears to be moving toward the upper or lower temperature limit. It is best to set the temperature mid-range to achieve an average of about 40°F (5°C). This temperature setting will provide the best safety margin.

The freezer temperature should be adjusted if it is outside the recommended range or if, over time, the temperature appears to be moving toward the upper temperature limit of 5°F (-15°C).

In some situations, the thermostat may need to be reset in summer and winter, depending on the room temperature. If so, post instructions about this procedure on the vaccine storage unit door and include this information in the Routine Vaccine Storage and Handling Plan (see section on Storage and Handling Plans).

Stabilizing the Temperature in a New or Newly Repaired Unit

Allow 1 week of twice daily refrigerator and freezer temperature recordings before using a newly installed or newly repaired refrigeration unit to store vaccines.

To maintain the cold chain during any period when the refrigerator or freezer is out of service, vaccines should be temporarily stored in an alternate vaccine storage unit until the temperature in the original unit can be stabilized within the recommended range. The alternate unit should be functioning properly and should have sufficient space to properly store the vaccines. Another option is to store the vaccines in an appropriately packed cooler if the storage unit will be out of service for a short time. However, if the refrigerator or freezer cannot be repaired in time to maintain the temperature in the cooler within the recommended range, move the vaccines to an alternate vaccine storage unit. Contact the state health department immunization program for policies regarding vaccine packing and procedures for maintaining the cold chain while the vaccine storage unit is not functioning properly or turned off.

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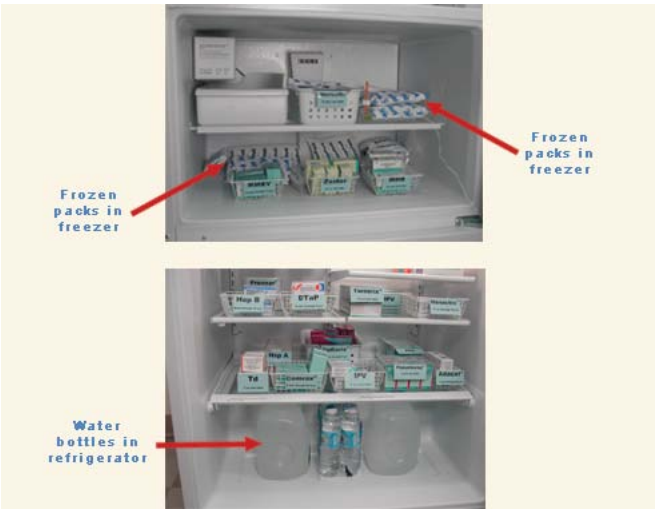
Stabilizing the Temperature with Water Bottles and Frozen Packs

You can help stabilize the temperature in the refrigerator by keeping at least two or three large containers of water inside. Store the water bottles against the inside walls and in the door racks. You can help stabilize the temperature in the freezer by keeping frozen packs or ice trays inside. Store the frozen packs along the walls, back, and bottom of the freezer compartment and inside the racks of the freezer door. Not only will water bottles and frozen packs help maintain an even temperature in the compartments with frequent opening and closing of the doors, they will also help keep the temperatures stable in the event of a power failure.



Stabilize the temperatures in a freezer with frozen packs and in a refrigerator with water bottles.

Opening the Door

Limit the number of times the vaccine storage unit doors are opened and avoid letting the doors stand open unnecessarily. Not only does this affect the temperature in the unit, it also exposes the vaccines to light (which can affect the potency of HPV, MMR, MMRV, rotavirus, varicella, and zoster vaccines). Routinely check the doors throughout the day and at the end of the day to ensure they are tightly closed.

Vegetable Bins

Consider removing the vegetable bins from the refrigerator. Removing the bins not only provides extra space for storing containers of water, but it also removes the temptation to use the bins for storage of food, beverages, or vaccines. Food and beverages should never be stored in a vaccine storage unit. Vaccines should never be stored near the floor of the refrigerator in the vegetable bins because the temperature in this area is different from that in the body of the refrigerator.

Temperature Variations

Temperatures can vary in a vaccine storage unit based on the contents, how often the door is opened, and power interruptions. The only way to be sure the temperature in the storage unit has remained within the recommended range is to frequently monitor and record the temperature using a thermometer.